MONOCHROA MOYSES SP. N., A NEW GELECHIID MOTH MINING THE LEAVES OF *SCIRPUS MARITIMUS* L.

R. W. J. Uffen

4 Mardley Avenue, Welwyn, Herts AL6 0UD.

Introduction

For some years, I have been finding gallery leaf mines in August on *Scirpus maritimus* L. at Mucking reedbed, Essex. The larvae leave the mines to overwinter and I could find no way to satisfy them in their search for hibernation sites.

In spring 1984 I found one larva in a sleeve containing the remains of overwintered plants that had been grown in a plastic bowl full of mud and water. This was confined to a sweet jar containing fresh, stunted young plants growing in wet vermiculite expanded mica. A long mine was found in early July. A female of a very dull-coloured *Monochroa* emerged in early August. The insect was incessantly active, running about like an ant, and became worn before I could photograph it. In subsequent conversation, I found that Eric Bradford had an unidentified male moth in his collection, probably of this species, captured at a BENHS field meeting in July 1971.

My information led John Langmaid and others to look for this species on an autumn foray in Essex. Moths were reared by at least one technique, involving keeping leaves moist in *Sphagnum* moss in sleeves. I am told that in this environment the larvae remained in the mines over winter and pupated there, whereas in the field all the mines are empty by late October.

Monochroa moyses sp. n.

Holotype, male, Essex, East Mersea, larva 1. x. 1986, mining in *Scirpus maritimus*, moth emerged 3. vi. 1987 (*Langmaid*) (BMNH) (Fig. 1).

Expanse 8.5 mm. Forewings light fuscous. Scales with pale bases and fuscous tips. Costa not paler. A dark mark formed of first few costal cilia, visible both above and beneath the wing. A short row of ochreous scales form an inconspicuous upper oblique dash behind this mark. A dark stigma three scales wide and three long lies

Fig. 1. *Monochroa moyses* holotype.

on or just behind the mid-line of the wing opposite the tip of this dash. Pale dash is faintly continued as a series of dashes parallel to costa nearly to wing tip. A dark line close to the base of the cilia passes round the wing tip and fades there.

Hindwings grey, mottled by gaps in the single layer of scales. Costal cilia and those behind the finger tip darker than wing.

Scape with a blunt, deciduous seta sited antero-ventrally closer to base than width of the scape. Flagellum pale on basal half beneath. Alternate rings of scales becoming paler away from flagellar base. No visible ciliation beneath. Palpi with segment 3 as long as front tibia, 2 slightly longer. Palpi generally fuscous (*cf.* female).

Scales on tegulae, thorax and abdomen are noticeably transparent between lines of pigment. Abdomen creamy beneath, and at sides beyond segment 5; grey above.

Front legs creamy externally and ventrally; fuscous above and internally. Mesothoracic and metathoracic legs fuscous, mottled paler from scale bases, scales half as long as inner hind spur, tarsi with pale tips to segments. *Tibial shanks without pale marks.* Cilia of hind tibiae creamy. Tibial spurs all fuscous externally, hind mid-tibial spur four-fifths as long as space to apex of tibia. Hind apical inner spur longer than outer mid-tibial spur and reaching about two-thirds of metatarsus.

Genitalia: BMNH Microlepidoptera slide no. 24509 (holotype male, Figs 2–4). Apex of aedeagus (Fig. 3) sprinkled externally with backwardly directed spicules. Vesica with five sclerotized bars. Uncus vestigial. Vinculum thick, curved. Valva and sacculus similar to that of *M. arundinatella* (Staint.). Valva heavily sclerotized, apex rounded, sacculus hinged and lobed.

One pair of pencil coremata, a pair of fans on the intersegmental membrane (Fig. 4).

The females are paler and more clearly marked than the only available male.

Paratype female, Essex, East Mersea, larva 1.x.1986, mining in *Scirpus maritimus*, moth emerged 3.vi.1987 (*Langmaid)* (BMNH).

Generally as male. Forewings coloured yellowish-grey: the fine, ligulate scales with deep creamy bases and grey-yellow tips. Costal area creamy at base (across to the convex radial vein), tapering to nothing at the start of the cilia. The profile of the costa is fuscous from the base as far as the combined lengths of front tibia and tarsus. Fuscous cilial and stigmatic marks as male. Base of cilia deep cream, overlain locally by dark scales to form inconspicuous dashes round the wing tip. Forewings fuscous beneath, except for the ochreous costa between a dark basal zone and the cilia, also paler beneath pale costal cilia.

Palpi having segment 2 fuscous externally narrowly light banded from paler scale-bases, dorsally and internally above creamy. Segment 3 creamy white on basal half, fuscous on apical half with an oblique junction between the colours.

Spathulate scales covering crown of head glossy, appearing slightly yellowish mid-grey from above, but whitish grey from the side. Face scales pale grey.

Genitalia: BMNH Microlepidoptera slide no. 24508 (paratype female, Figs 5–7). Ovipositor long; apical lobes twice as long as wide, the ring of coarse setae one-third the length of the lobes from their bases; posterior apophysis about as long as the distance from the tip of segment 8 to the tip of the anterior apophysis. The latter distance is about 3.6× the apical width of the uncompressed eighth segment. Anterior apophysis nearly reaching the sclerotized colliculum of the ductus bursae.

Apex of segment 8 having about six setae visible ventrally. The pockets directed anteriorly giving a slightly hooked outline to the sternite.

Fig. 2. *Monochroa moyses* holotype genitalia less aedeagus.

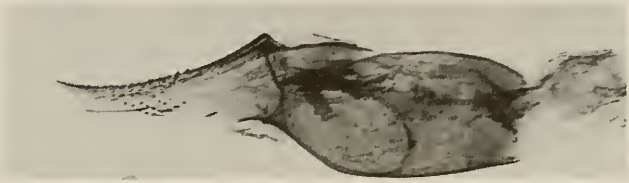

Fig. 3. *Monochroa moyses* holotype aedeagus.

Fig. 4. *Monochroa moyses* holotype coremata.

Ostial opening half way down segment 8, the duct delicate and unsculptured as far as the short colliculum, thereafter weakly corrugated. Signum a dense, irregular spot (figs 6, 7).

Fig. 8 shows the female genitalia of one of Karsholt's Dutch specimens.

Other paratypes: two females, Essex, East Mersea, larvae 1.x.1986, mining in *Scirpus maritimus*, moths emerged 5.vi.1987 and 11.vi.1987, (in coll. J.R. Langmaid).

Other records: VC18 Mucking reedbed, Essex, larvae from about 1980 onwards, one female emerged early August 1984; one male E. S. Bradford 3.vii.1971. Larvae

Fig. 5. *Monochroa moyses* paratype female apex of genitalia.

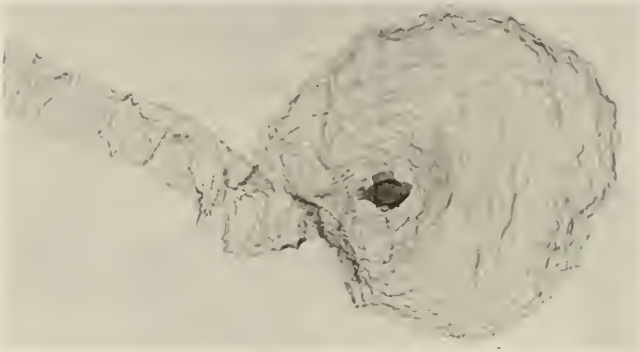

Fig. 6. *Monochroa moyses* paratype bursa copulatrix.

Fig. 7. *Monochroa moyses* paratype signum.

Fig. 8. *Monochroa moyses* female genitalia: Holland, Z. H., Melissant, 5.vii.83, leg. coll. H. J. Huisman, slide OK 4520 of O. Karsholt.

Leigh, Essex, A. M. Emmet and D. J. L. Agassiz. Grays, Essex, one at light, D. J. L. Agassiz. VC25 Oxley Marshes, Kent, A. M. Emmet; Cliffe Marshes, Kent, larvae collected 28.ix.1986, one emerged 24.v.1987, P. Sterling.

A moth bred from East Mersea 6.vii.1987 by E. C. Pelham-Clinton is figured in colour in *Br. J. Ent. Nat. Hist.* 2 plate 2 figure 4 (April 1989).

Mr O. Karsholt saw the material of *M. moyses* in Dr Langmaid's collection and recognized three Dutch specimens as belonging to this species. He has kindly supplied the following details, together with the additional figure of female genitalia photographed by Bent Rasmussen and reproduced as Fig. 8: Holland, Z. H., Melissant, female 5.vii.1983, leg. & coll. H. J. Huisman, praep. OK 4520 (on slide). Holland, Zl., Waarde, male and female 17.vi.1978, leg. & coll. H. Van der Wolf, praep. Wf. 813, 2720 (on same pins as specimens).

The species is named after the prophet Moses in allusion to spending its youth concealed in rushes. There is a further ecclesiastical connection in that Mucking reedbed lies in the shadow of Mucking church, where lies buried its former rector, C. R. N. Burrows, who supplied much material to Pierce and Metcalfe for their still-reprinted work on the genitalia of the British Lepidoptera.

I have chosen to describe this species from Dr. Langmaid's Mersea Island material because of its excellent condition and representation of both sexes. I am much indebted to him for the opportunity and for presenting a pair of specimens, of which the genitalia are figured, to the British Museum (Natural History). It requires experience of the group to mount the genitalia of *Monochroa* to show their characteristics. Dr Klaus Sattler kindly undertook to prepare the male and female genitalia and obtained the photographs of moths and genitalia. The photographs of mines and larvae are by the writer.

Similar British species

M. hornigi (Staud.) is distinguished by the pale band at the tip of the hind tibia (BM continental material also has one from the mid-tibial spurs) and larger expanse (9–11.5 mm).

The female has a short ovipositor, the apical lobes as long as wide and with the coarse setae near their bases. The apex of the eighth segment has about 12 setae visible ventrally, the pockets on the sternite are directed internally within the outline of the sternite and the ostium opens near the base of the segment. The apex of the anterior apophysis lies at 0.4 of the length of the ductus to the colliculum. The apex of the eighth segment is poorly defined in the slide.

The male aedeagus has a long sclerite down one face, but is only micro-spiculate. The vesica has about 12 broadly-based thorns.

M. arundinatella (Staint.) normally has additional patterning and paler colour. Pierce and Metcalfe do not figure the genitalia, but there is a slide of Pierce's in the BM collection showing both sexes. The female has a long ovipositor, but the ductus is smoothly sclerotized for the length of the anterior apophysis, the apex of which is only 2.5× the apical width of segment 8 away from the tip of the segment. The signum is large, triangular, with two large thorns at the base and one at the apex.

The male genitalia of *M. arundinatella* are distinguished by the absence of external spicules on the aedeagus, but presence of many thin setae in the apical zone of the vesica. The uncus is very short, but not vestigial.

Biology

I have not found the eggs, and surmise from the long ovipositor of the females that they may be laid in the leaf sheaths of *Scirpus maritimus*. It is possible that they are laid on the underside of the leaves and are destroyed by the larvae as the mine is commenced.

Fig. 9. *Monochroa moyses* leaf mines of two mature larvae.

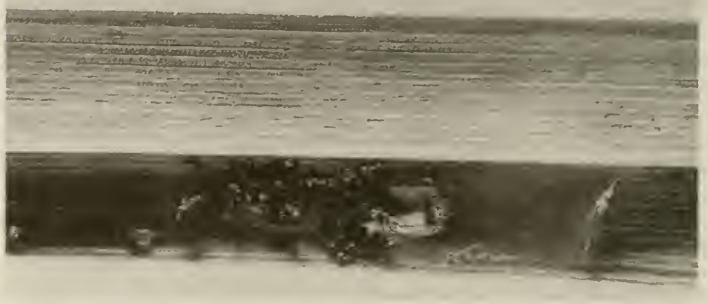

Fig. 10. Detail of entrance hole with frass caught on suspended silken platform.

Fig. 11. *Monochroa moyses* dorsal view of final instar larva.

Fig. 12. Lateral view of final instar larva.

The mines are full depth, but always have the entrance hole, and sometimes a separate exit hole, on the underside of the leaf. They occur at any point along the leaf. The larva most commonly mines upwards from the entrance hole. The mine is devoid of frass, which is ejected from the point of entry (Fig. 9).

The larva begins by making a mine under 1 mm wide, but locally widened, and around 12 mm long. It then moults. This mine is lined near the entrance with an opaque, robust layer of silk. Extending along the underside of the leaf for about the length of the larva either end of the entrance hole there is a fine, suspended film of silk, beneath which the larva emerges to excrete. Frass is sometimes caught up in this silk or around the entrance hole (Fig. 10).

First and some second instar mines were found at Mucking on 26.viii.1984. The second instar repeats the features of the mines of the first, except that the mine is now about 2 mm wide and typically 25 mm long. The larva begins by spinning the silken roof of about its own length above the proposed point of entry. The opaque silken mat within the mine is on the lower surface and extends for about the length of the larva from the entrance hole. The external silken film is not repaired when damaged.

The third instar makes mines up to 70–100 mm long, with frass accumulating at one end of the older mines. The larva leaves the mine for the winter. On 17.vi.1985 I found six mines, starting very narrow and with frass over their entire length. These all contained dead larvae, one being a husk full of hymenopterous cocoons.

The larva is white, cylindrical, with well-developed prolegs with crochets. The head is prognathous, square in front, with the mandibular area projecting. The larva is very active, wriggling backwards and forwards with equal facility (Figs 11 & 12).

I have not found the larvae in the lagoons behind sea walls, where the plant grows in deep water. At Mucking they are mainly round the edge of the reedbed, adjoining a dry bank or a wet field margin. At East Mersea on 5.ix.1989 many mines were already empty. The colony was almost confined to a then-dry ditch running perpendicular to the usual sea-wall lagoon.

There is already one linear miner, *Elaschista scirpi* Staint., recorded from *Scirpus maritimus* at a different season, but I have never found it. *E. scirpi* is well represented in the Hering mine herbarium, but there are no *M. moyses* there. Possibly a Continental foodplant will be found to be *Scirpus sylvaticus*, which offers similar conditions inland.

ACKNOWLEDGEMENTS

Col. A. M. Emmet and Rev. D. J. L. Agassiz gave invaluable help in choosing an apposite spelling for the specific name. All those mentioned as recorders have willingly helped to complete the story.

SHORT COMMUNICATIONS

***Xylophagus cinctus* Degeer (Diptera: Xylophagidae) new to Wester Ross.**—A visit to Scotland to search for this and other insect species was successful in discovering this 'old pine forest' relict away from the well-known sites around the Cairngorm Massif. Larvae were found beneath bark on a fallen pine close to the Mountain Trail in Beinn Eighe National Nature Reserve in Wester Ross (NH 0064), 4.viii.1989. This